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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT
APPEALS AND INTERFERENCES

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Technology Center 2100

In re patent application of
Lynice S. SPANGLER et al.

Group Art Unit: 2155

Examiner: Liang Che A Wang

For: TECHNIQUES OF UTILIZING ACTUALLY UNUSED
BANDWIDTH (as amended)

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APPELLANT'S BRIEF ON APPEAL UNDER 37 C.F.R. § 1.192(c)

Sir:

The following comprises Appellant's Brief on Appeal against the final rejection dated March 14, 2003, rejecting claims 1-24. This Appeal Brief is filed in triplicate and is accompanied by the required appeal fee set forth in 37 C.F.R. § 1.17(f). Appellant's Notice of Appeal was filed on July 14, 2003.

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REAL PARTY IN INTEREST

The real party in interest in this appeal is Intel Corporation, assignee of the entire interest in the above-identified patent application.

RELATED APPEALS AND INTERFERENCES

The Appellant, their legal representative, and the assignee are presently unaware of any appeal or interference which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

STATUS OF THE CLAIMS

This is an appeal from the final Office Action dated March 14, 2003, wherein all claims stood rejected on prior art grounds under either 35 U.S.C. § 102(e) or §103(a).

A Response was filed under 37 C.F.R. § 1.116 on May 8, 2003 responding to the final Office Action, but not amending any claims. Thus, the claims stand as amended in Applicant's response to the Office Action of December 11, 2002. Claims 1-24 are appealed and are set forth in their entirety in Appendix A.

STATUS OF THE AMENDMENTS

All amendments have been entered.

SUMMARY OF THE INVENTION

Briefly, embodiments of the present invention relate to a method and apparatus for maximizing bandwidth usage. A determination is made whether information scheduled to be broadcast is utilizing all bandwidth previously allocated to broadcasting the information, and if not, additional information is broadcast using an unused portion of the previously

allocated bandwidth.

As shown for Example in Figure 2, and explained on pages 3 and 4 of the application if the management system 8 determines 100 that the total bandwidth available to it is being used, the management system 8 waits 105 for a specified period before again determining, whether the total bandwidth continues to be used. The management system 8 cycles through repeated determinations until a portion of the total bandwidth becomes available for another use.

If bandwidth becomes available, the management system 8 determines 110 whether the available bandwidth is allocated or unallocated. Figure 3, which shows an exemplary schedule of allocated events, illustrates the distinction between allocated and unallocated bandwidth types. In Figure 2, various events appear as rectangular blocks. In this simplified case, each program occupies a fixed amount of bandwidth for a given length of time. For instance, Program 2, is an event that has been scheduled or guaranteed to occupy 2Mbps from 10:00 AM until 12:00 PM. Thus, Program 2 has been allocated 2Mbps of bandwidth for a duration of 2 hours. Located to the upper right of the Program 2 rectangle lies a block denoted Opportunistic Bandwidth. Between 11:00 AM and 12:00 PM no events have been scheduled to occupy the bandwidth between 10 Mbps and 12 Mbps.

Returning to Figure 2, if management system 8 determines that there is unallocated bandwidth in the bandwidth pipe, it chooses 115 opportunistic content that is able to fit into the unoccupied bandwidth for the proper duration, and delivers it to the bandwidth pipe 60 for broadcasting.

ISSUES

1. Whether claims 1, 3, 6-8, 10, 13-15, 17, 20, 21, and 23 are anticipated under 35 U.S.C. §102(e) over U.S. Patent 5,884,037 to Aras et al. (Aras)?
2. Whether claims 2, 4-5, 9, 11-12, 16, 18-20, 22, and 24 are unpatentable under 35 U.S.C. § 103(a) as being unpatentable over Aras in view of U.S. Patent 5,502,370 to Hall?

GROUPING OF THE CLAIMS

The rejected claims do not stand or fall together. The claims are grouped as follows:

Group I. Claims: 1, 3, 6, 7, 8, 13, 14, 15, 20, 21, and 23;

Group II: Claims: 2, 4, 9-12, 16-18, 22, and 24; and

Group III: 5 and 19.

Appellant submits that claims in Group II are patentable not only by virtue of their dependency from claims on Group I, but also separately patentable by virtue of the added feature of limiting the amount of additional information to a preset percentage of the total available bandwidth.

Appellant submits the claims of Group III are patentable not only by virtue of their dependency from claims in Groups I and II, but also separately patentable by virtue of the added limitation stopping the broadcast of additional information based upon at least one of a content provider and a sequence of content provision.

ARGUMENT

As a matter of law, the prior art rejections are in error and are made through the Examiner's impermissible use of hindsight gained by knowledge of Appellant's invention. Indeed, as discussed below, the rejections are made through a misapplication of the law. Further, as a matter of fact, the Examiner's analysis of the references with regard to the claimed invention is fatally flawed and erroneous for the reasons given below.

A. The Prior Art

U.S. Patent 5,884,037 to Aras:

Aras appears to be directed to a reservation bandwidth system for allocation of network resources using an autoregressive integrated moving average method. The bandwidth predicting algorithm utilizes an autoregressive integrated moving average trend analysis to forecast future values of bandwidth capacity at a link or system level used by elements that do not conform to a reservation policy. The bandwidth predictor may utilize a utility that analyzes the bandwidth utilization trend over a previous period of time and generates appropriate seasonal coefficients to be used by the predictor algorithm.

As stated in the last lines of column 2 through the top of column 3, "To improve bandwidth management, the present invention uses seasonal Autoregressive Integrated Moving Average ("ARIMA") trend analysis to enhance reservation-based management systems. Seasonal ARIMA models provide a flexible means of forecasting future values of a variable based solely on the periodicity of the past occurrences. The periodic version of the ARIMA model is used because established networks generally have utilization curves that demonstrate strong seasonal tendencies. The present invention includes the following components: a static model generation utility ("SMGU") and a non-conforming bandwidth predictor ("NCBP").

The SMGU is an off-line utility that analyzes the bandwidth utilization trend over the previous period of time and generates the appropriate seasonal ARIMA coefficients to be used by the bandwidth predictor" (emphasis added).

Thus, Aras appears to be concerned with ways to forecast or predict future bandwidth availability based on current and past trends.

U.S. Patent 5,502,370 to Hall et al. (Hall):

Hall appears to be directed to a power factor control circuit for keeping average AC line current sinusoidal and in phase. This reference has absolutely nothing to do with the present invention other than the fact that it uses the words “bandwidth” and “percentage” in the same paragraph in column 5.

B. The Claimed Invention:

All claims in all groups recite the feature, in this or similar language:

“...determining whether information scheduled to be broadcast digitally is actually utilizing all bandwidth previously allocated to broadcasting the information; and if not, broadcasting additional information using an unused portion of the previously allocated bandwidth” (emphasis added).

C. The Examiner's Application on the Prior Art to the Independent Claims in Group I

The Examiner has relied on Aras for “determining the usage of predicted bandwidth and utilizing the unused portion of the predicted available bandwidth... however, Aras is *actually* utilizing all bandwidth previously predicted”.

The Examiner does seem to recognize that the present invention may distinguish over Aras when he states on page 3 of the final Office Action:

“Although applicant's invention might be different from Aras's, however, the claimed limitations have not made enough distinction” (emphasis added).

Appellants respectfully submit that the claims as presented adequately distinguish over the prior art of record.

As a matter of law, these rejections are in error and, as discussed below, the

Examiner has made the rejection only through the use of impermissible hindsight reconstruction gained by knowledge of Appellant's invention. Further, as a matter of fact, the Examiner's analysis of the references with regard to the claimed invention is flawed and erroneous as also discussed below.

D. The Examiner's Rejection is in Error as a Matter of Law

The independent claims, included in Group I, have been rejected as being anticipated by Aras. This rejection is respectfully traversed.

MPEP § 2131 mandates that "TO ANTICIPATE A CLAIM, THE REFERENCE MUST TEACH EVERY ELEMENT IN THE CLAIM". Furthermore, the MPEP, citing Richardson v. Suzuki Motor Co., 9 USPQ2d 1051, 1053 (Fed. Cir. 1987), states "[t]he identical invention must be shown in as complete detail as is contained in the... claim" (emphasis added).

Here, Aras determines the predicted bandwidth, that is the bandwidth which will be used. Aras teaches a model for predicting bandwidth. The reason that the word "actually" was amended into the independent claims is the degree with which the word "actual" distinguishes over prediction. People always think of prediction versus actual. A prediction is a guess of what will occur in the future. The actual is what actually does occur. The statement in the rejection that Aras actually uses all the bandwidth previously predicted is simply incorrect. Aras teaches a model from which a prediction of bandwidth can be detected. While it is true that Aras checks the actual bandwidth utilization at a given time see column 5 lines 52-53, he does that in order to predict the bandwidth that will be needed in the future. He does not use this determination to broadcast... additional information... using an unused portion of the previously allocated bandwidth. In fact, all that Aras does with his information is improve his model. The last paragraph of column 5 explains that past predictions may be compared with actual bandwidth. However, that information is "communicated to the model shaping... lines 64-65, in order to correct the model and reduce the errors. Aras teaches nothing about

using whatever bandwidth is left over to broadcast additional information, as claimed.

Therefore, to summarize the above, Aras teaches nothing about determining actual bandwidth utilization and "broadcasting additional information using an unused portion of the previously allocated bandwidth" as claimed.

It is therefore respectfully submitted that the rejections to the claims are improper as a matter of law under Section 102 as Aras cannot anticipate the rejected claims since it does not "teach the identical invention". Based on the above discussion with reference to the MPEP guidelines, it is respectfully requested that the rejections based on 35 U.S.C. § 102 be withdrawn.

This being the only rejection to the claims in Group I, it is respectfully requested that the Examiner be reversed and that these claims be allowed.

Claims in GROUP II are allowable:

With regard to the claims in Group II, including 2, 4, 9-12, 16-18, 22, and 24, these claims require "*limiting the amount of additional information to a preset percentage of the total available bandwidth*" as recited in claim 2, or similar language. This is discussed on page 5 of the application wherein it explains by way of example:

"For example, content that has been guaranteed 2 Mbps for one hour may use only 1 Mbps for the first ten minutes and then fully utilize its allocation of 2 Mbps for the remainder of the hour. Therefore, to make sure that the opportunistic content does not interfere with guaranteed content, the management system 8 provides 130 opportunistic content up until a certain percentage, for example 90 percent, of the total bandwidth has been reached. That percentage, called the configurable rate, can be modified and adjusted".

The Examiner has relied on Hall in combination with Aras for teaching this "percentage of bandwidth" feature. However, before discussing the merits of Hall,

Appellant s submits that the Examiner has not met his initial burden of showing a *prima facie* case of obviousness because Hall involves non-analogous art when compared with Appellant's invention and Aras. Hall teaches power factor control. That is, a way to keep AC line current sinusoidal and in phase with line voltage. This is in the power electronics arts and is completely unrelated to either the teachings if Aras or Appellant's claimed invention. Conversely, Applicant's invention is directed to digital broadcast bandwidth allocation. Therefore, one skilled in the art of digital information broadcast would not have been motivated to refer to alternating current (AC) power control arts teaching regarding bandwidth allocation perentages.

Analogous art is all art that is either in the field of technology of the claimed invention or deals with the same problem solved by the claimed invention. There is no common environment between the references cited by the Examiner. The Examiner has focused too heavily upon the searchable key words involved, rather than on the subject matter as a whole. For the teachings of a reference to be prior art under §103, there must be some basis for concluding that the reference would have been considered by one skilled in the particular art working on the pertinent problem to which the invention pertains. Here, there is none.

That being said, with regard to Hall, Hall simply teaches that it is known to look at a preset percentage allocation. However, the patent law requires that in order to combine to references, there must be some incentive or motivation in the references to make the combination. The case of re Nilssen, cited by the official action, makes exactly this point. While it is not necessary that the references suggest the combination, it is certainly necessary that one having ordinary skill in the art would have considered making the combination. Hall teaches a power factor control circuit for a control loop. Power factor has nothing to do with bandwidth. Therefore, since the two pieces of prior art are an entirely different fields of endeavor, why would one having ordinary skill in the art think to combine the references to make the combination? The only way that the examiner found this prior art was by looking for key words. If one makes the search for a key words, of course, one might find these words in the prior art. However, that requires knowing the answer in advance. One having ordinary skill in the art would not look to

power factor control systems for guidance on what to do with allocation of unused bandwidth. The motivation for making this hypothetical combination was hindsight, not the teaching of the prior art.

In summary, then, there is a distinct difference between the present system and the prior art. Specifically, Aras relates to determination of whether bandwidth is used in order to make a prediction about future bandwidth, while the present claims specifically require using that analysis to "broadcast[ing] additional information using an unused portion of the previously allocated bandwidth". Moreover, the hypothetical combination of references are from such disparate fields that it is respectfully suggested that the combination was made based on hindsight, not based on what one having ordinary skill in the art would have understood.

It is thus respectfully submitted that the claims of Group II, reciting "*limiting the amount of additional information to a preset percentage of the total available bandwidth*" or similar language, is simply not taught or suggested by the combination of Aras and Hall and thus, the Board is respectfully requested to reverse the Examiner with regard to these claims.

Claims in GROUP III are allowable:

With regard to the claims in Group III, including claims 5 and 19, these claims recite "*wherein said broadcasting the portion of the additional information to be stopped is selected based upon at least one of content provider, bandwidth range and sequence of content provision*" as recited in claim 5 or similar language.

This is explained on page 6 of the application as:

"When the configurable rate threshold is reached, the management system 8 stops 140 the broadcast of the last opportunistic content added to the bandwidth pipe 60 or, if several different units of opportunistic content have been added, the management system 8 selects which unit of content to stop broadcasting based on various criteria, such as customer, bandwidth range or sequence of order placement. While the duration of the guaranteed event to which opportunistic content has been added lasts, the system 8 monitors 145 the delivered content, both guaranteed and opportunistic, to determine

whether their combined bandwidth remains under the threshold. When the guaranteed event concludes, the system 8 returns to the beginning of the process and monitors the bandwidth pipe 60 to determine whether the entire pipe is being utilized" (emphasis added).

The Examiner has indicated that this feature is taught by column 9, lines 57-61 of Aras, however, column 9, lines 57-61 of Aras states: "*If the MSE is less than the MSE_limit, then a signal indicating that the bandwidth prediction is available is returned to the connection agent 105 in step 1506. Otherwise, a "no bandwidth available" indicator is returned to the connection agent 105 in step 1507*".

It is respectfully submitted that the Examiner is in error as this, or nothing else in Aras or Hall remotely suggest "*wherein said broadcasting the portion of the additional information to be stopped is selected based upon at least one of content provider, bandwidth range and sequence of content provision*" as recited in the claims of Group III. Thus, the Examiner should be reversed with regard to these claims

Referring to MPEP § 2143, titled "Basic Requirements for a *Prima Facie* case of Obviousness", the MPEP mandates that:

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claimed limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not applicant's disclosure." (emphasis added).

It is again respectfully submitted that all of the features, recited in the claims of Groups II and III, as discussed above, are not present even if Aras and Hall are combined. Thus, the combination does not show *prima facie* obviousness under § 103.

It is incumbent upon the Examiner to establish a factual basis to support the legal

conclusion of obviousness. In re Fine, 837 F.2d 1071, 5 U.S.P.Q. 2d 1596 (Fed. Cir. 1988). This objective can only be established by an objective teaching in the prior art or by cogent reasoning that the knowledge is available to one of ordinary skill in the art. In re Lalu, 747 F.2d 703, 223 U.S.P.Q. 1257 (Fed. Cir. 1988). Here there is none.

Indeed, in the case at hand, the Examiner has failed to disregard what he has been taught by the present invention and has failed to cast his mind back to the time that the invention was made to determine what would have been obvious to one ordinarily skilled in the art who had available only the references and the then-accepted wisdom in the art.

Assuming *arguendo* that Aras could be interpreted in the manner suggested by the Examiner, the rejection would still be insufficient since as a matter of fact both Aras and Hall fail to teach the above highlighted claim recitations.

The PTO has the initial burden under section 103 to establish a *prima facie* case of obviousness. See, In re Piasecki, 223 USPQ 785, 788; In re Fine, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). The PTO can satisfy this burden *only* by showing some *objective* teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. In re Lalu, *supra*; see also, Ashland Oil, Inc. V. Delta Resins & Refractories, Inc., 776 F.2d 281, 297 n.24, 227 USPQ 657, 667 n.24 (Fed. Cir. 1985); ACS Hosp. Sys., Inc. v. Monteviore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). Here, it is respectfully submitted that the Examiner has failed to show *prima facie* obviousness.

As such, it is respectfully requested that the Board reverse the Examiner and allow all claims.

CONCLUSION

In sum, Appellants have invented a unique and non-obvious system for efficiently utilizing actual bandwidth in a digital communication system. Appellant submits that there is no reason, motivation, or suggestion found in the references to combine them in the manner urged by the Examiner. Moreover, the primary combination of Aras and Hall is fatally flawed since neither reference, alone or in combination teaches or suggests

"...determining whether information scheduled to be broadcast digitally is actually utilizing all bandwidth previously allocated to broadcasting the information; and if not, broadcasting additional information using an unused portion of the previously allocated bandwidth" (emphasis added), as claimed. Moreover, the references are also silent with regard to the features recited in the dependent claims including *limiting the amount of additional information to a preset percentage of the total available bandwidth*" as recited in the claims of Group II, or "*wherein said broadcasting the portion of the additional information to be stopped is selected based upon at least one of content provider, bandwidth range and sequence of content provision*" as recited in the claims of Group III.

Therefore, the combination of Aras and Hall, taken alone or in combination is clearly improper and one which is impermissible as a matter of law. Furthermore, it is an impossible combination as a matter of fact since the claimed invention is simply not taught or suggested.

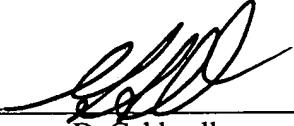
Appellant submits that, in attempting to yield the claimed invention, the Examiner has strained the reasonable limits on what the cited references teach or suggest, in urging the prior art combination and in making his assertions as to what "would" have been done by the ordinarily skilled artisan in view of the prior art at the time of the invention. Clearly, the teachings in the prior art, taken single or, even assuming *arguendo*, in combination, fail to teach or suggest the invention as defined by Appellant's claims.

Accordingly, Appellant submits that claims 1-24, all claims presently pending in the application, are patentable and are otherwise in condition for allowance. Therefore, Appellant respectfully requests the Board to reverse the Examiner's rejections of claims 1-24.

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Respectfully submitted,
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN, LLP

Date: 11/13/03


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APPENDIX A

1 (Previously Presented). A method comprising:

determining whether information scheduled to be broadcast digitally is actually utilizing all bandwidth previously allocated to broadcasting the information; and

if not, broadcasting additional information using an unused portion of the previously allocated bandwidth.

2. (Original) The method of claim 1 further comprising limiting the amount of additional information to a preset percentage of the total available bandwidth.

3. (Original) The method of claim 1 including determining in real-time whether additional information can be broadcast over a portion of the previously allocated bandwidth that is actually unused.

4. (Original) The method of claim 2 wherein said broadcasting of a portion of the additional information is stopped when the preset percentage is reached.

5. (Original) The method of claim 4 wherein said broadcasting the portion of the additional information to be stopped is selected based upon at least one of content provider, bandwidth range and sequence of content provision.

6. (Previously Presented) The method of claim 1 including determining in real-time whether there is any unallocated bandwidth; and, if there is unallocated bandwidth with respect to a particular timeframe, broadcasting supplementary information to occupy at least a portion of the unallocated bandwidth during the particular timeframe.

7. (Original) The method of claim 6 including determining in advance of the particular timeframe whether the supplementary information can be broadcast over

the unallocated bandwidth.

8. (Previously Presented) A digital communication system comprising:
an automated management system that controls scheduling of digital broadcasts, and is configured to determine whether information scheduled to be broadcast actually utilizes all bandwidth previously allocated to broadcasting the information, and if not, to broadcast additional information using an unused portion of the previously allocated bandwidth.
9. (Original) The digital communication system of claim 8 wherein the automated management system is configured to limit the amount of additional information to a preset percentage of the total available bandwidth.
10. (Original) The digital communication system of claim 8 wherein the automated management system is configured to determine whether additional information can be broadcast over a portion of the previously allocated bandwidth that is actually unused.
11. (Original) The digital communication system of claim 9 wherein the system is configured to stop the broadcast of a portion of the additional information when the preset percentage is reached.
12. (Original) The digital communication system of claim 11 wherein the system is configured to select the portion of the additional information to be stopped based on at least one of content provider, bandwidth range, and sequence of content provision.
13. (Original) The digital communication system of claim 8 wherein the automated management system is configured to determine whether there is any unallocated bandwidth; and, if there is unallocated bandwidth with respect to a particular timeframe, the system is configured to broadcast supplementary information to

occupy at least a portion of the unallocated bandwidth during the particular timeframe.

14. (Original) The digital communication system of claim 13 wherein the automated management system is configured to determine in advance of the particular timeframe whether the supplementary information can be broadcast over the unallocated bandwidth.

15. (Previously Presented) An article comprising a computer-readable medium which stores computer-executable instructions for causing a computer system to:

determine whether information scheduled to be broadcast over a digital network is actually utilizing all bandwidth previously allocated to broadcasting the information; and

if not, broadcast additional information using an unused portion of the previously allocated bandwidth.

16. (Original) The article of claim 15 which further stores instructions that cause the computer system to limit the amount of additional information to a preset percentage of the available bandwidth.

17. (Original) The article of claim 15 which further stores instructions that cause the computer system to determine whether additional information can be broadcast over a portion of the previously allocated bandwidth that is actually unused.

18. (Original) The article of claim 16 which further stores instructions that cause the computer system to stop broadcasting a portion of additional information when the preset percentage is reached.

19. (Original) The article of claim 18 which further stores instructions that cause a computer to stop broadcasting a portion of the additional information and wherein the portion of the additional information is selected based on at least one of content

provider, bandwidth range and sequence of content provision.

20. (Original) The article of claim 15 which further stores instructions that cause a computer to determine in real-time whether there is any unallocated bandwidth; and, if there is unallocated bandwidth with respect to a particular timeframe, broadcasting supplementary information to occupy at least a portion of the unallocated bandwidth during the particular timeframe.

21. (Original) A digital communication system comprising:
a bandwidth pipe operable to transport digital information;
a monitor to determine bandwidth usage in the bandwidth pipe;
a system manager to broadcast additional information if there is available bandwidth in the bandwidth pipe, using an unused portion of the previously allocated bandwidth;

22. (Original) The digital communication system of claim 21 wherein the system manager limits the amount of additional information to a preset percentage of the total available bandwidth.

23. (Original) A method comprising:
broadcasting a program that occupies an amount of bandwidth over a cable;
monitoring the amount of bandwidth the program uses;
and if bandwidth is available, broadcasting additional information over the cable.

24. (Original) The method of claim 23 including limiting the amount of additional information to a preset percentage of the total available bandwidth.